

We Claim:

1. A method for producing semiconductor components, comprising the steps of:
  - applying at least one hydrogen fluoride soluble masking layer on an epitaxy substrate such that said masking layer defines at least one epitaxy first window wherein said masking layer is not applied;
  - epitaxially growing at least one semiconductor layer in at least one of said first window, said epitaxial growth occurring within an epitaxy reactor; and
  - removing said masking layer through use of an etchant, said etchant comprising at least a fluoride, and said removal occurring within said reactor.
2. The method according to claim 1, wherein said etchant comprises hydrogen fluoride.
3. The method according to claim 1, wherein said etchant comprises an unstable fluoride combination which disintegrates into hydrogen fluoride within said reactor.
4. The method according to claim 1, wherein said HF soluble masking layer comprises a plurality of masking layers each having a different thickness; and the method further comprising the step of sequentially and individually etching each of said plurality of layers so as to create at least one second window in place of each etched masking layer.
5. The method according to claim 1, wherein said at least one masking layer comprises a plurality of layers each having a unique composition; and the method further comprising the step of sequentially and individually etching each of said plurality of layers so as to create at least one second window in place of each etched masking layer.
6. The method according to claim 4, further comprising the step of epitaxially layering semiconductor material in each of said second windows.
7. The method according to claim 5, further comprising the step of epitaxially layering semiconductor material in each of said second windows.

8. The method according to claim 1, further comprising the step of initially cleaning said substrate within said epitaxy reactor by introduction of at least one fluoride based hydrogen fluoride soluble layer.
9. The method according to claim 1, wherein said at least one semiconductor material comprises an epitaxially layered first wave guide layer, at least one active laser layer, and a second wave-guide layer, and the method further comprises the step of epitaxially layering wave-guide material in place of said etched masking layer.
10. A method of producing laterally integrated semiconductor components, comprising the steps of:
  - applying at least one first semiconductor component on an epitaxial substrate;
  - layering a first hydrogen fluoride soluble mask over said first semiconductor component and epitaxial substrate, said mask defining at least one window on said substrate for application of at least one other semiconductor components; and
  - applying said other semiconductor component in at least one of said defined window.
11. The method according to claim 10, wherein said mask defines said window by a thinner mask layer with respect to a mask layer covering said first semiconductor component; and the step of layering further comprises the step of removing a portion of said first mask layer so as to further expose said window.
12. The method according to claim 10, wherein said first semiconductor component is an electrical component and said other semiconductor component is an optoelectrical component.
13. A method for producing semiconductor components comprising the steps of:
  - applying at least one first semiconductor component on an epitaxial substrate;
  - applying n number of masking layers on said epitaxial substrate and first semiconductor component, wherein each of said masking layers defines at

least one window for application of at least one other semiconductor component, and wherein  $n$  is a natural number;

- etching at least one of said  $n$  number of masking layers; and
- applying at least one other semiconductor component in at least one of said window defined by said etched masking layer.

14. The method according to claim 13, further comprising the step of:

- repeating the step of etching and applying at least one other semiconductor component until only one masking layer remains.

15. The method according to claim 13, wherein said  $n$  number of masking layers are hydrogen fluoride soluble masking layers and said step of etching is effected by introduction of an etchant containing fluoride.

16. The method according to claim 13, wherein each of said steps is performed within an epitaxy reactor.

17. The method according to claim 13, wherein said first semiconductor component is different from said other semiconductor component.

18. The method according to claim 17, wherein said first semiconductor component is an electrical component and said other semiconductor component is an optoelectronic component.